Fostering Sustainable Cities:

The Role of Environmental
Education and Communication

A GreenCOM Discussion Paper
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About the Author

Paula Tarnapol Whitacre is a writer specializing in environment and development issues. Previously, she was the director of the Information Exchange Center of the Environmental Education and Communication (GreenCOM) Project, and it was at that time that she embarked on writing this publication. The Center is a focal point for the synthesis and dissemination of environmental education and communication materials worldwide. Prior to joining GreenCOM, she was communications director at the Society of American Foresters from 1986 to 1994. Ms. Whitacre has also served as a Foreign Service Information Officer with the U.S. Information Agency and as a journalist and freelance writer in the United States and in Asia. She has her B.A. and M.A. in international studies from the Johns Hopkins School of Advanced International Studies.

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Acknowledgments

About This Series

This discussion paper is one in a series produced by the Environmental Education and Communication (GreenCOM) Project of the United States Agency for International Development. The series is intended for policy makers, program managers, technical specialists, and others seeking new tools and ideas to achieve environmentally sustainable development. The discussion papers explore the role that Environmental Education and Communication (EE&C) can play in helping people solve a range of environment and development concerns. Topics covered in the series include—

- ▸ Policy Development
- ▸ Biodiversity Conservation
- ▸ Sustainable Urbanization
- ▸ Freshwater and Coastal Resources
- ▸ Gender
- ▸ Basic Education

These papers do not provide all the answers. We hope, however, that they serve as a starting point for discussion, inquiry, and action.

Framework:
How EE&C Can Help Foster
Sustainable Cities

Growing populations and unequal consumption patterns place great demands on cities. Housing, water and sanitation facilities, roads, and other components of the urban infrastructure continually need to be built, maintained, and expanded. Striving for sustainability, it seems, requires that urban planners and managers work with projects from three different dimensions: Environmental concerns will bring technical expertise; financial sustainability will bring an economic future; and participation can help insure that the citizens agree with and will continue to support a project. Without all three dimensions, the most perfect plan may falter.

Most urban experts recognize the important role that people play in achieving sustainable urbanization. HABITAT II's Global Plan of Action states clearly in its preamble: "Human beings are at the centre of concerns for sustainable development." That said, however, how can those concerned with the future of the world's cities truly

> *"How can those concerned with the future of the world's cities truly involve people in creating and sustaining adequate shelter, services, and infrastructure?"*

involve people in creating and sustaining adequate shelter, services, and infrastructure? How can municipalities, community organizations, and businesses that have never worked together before begin to cooperate with and trust one another?

Environmental Education and Communication (EE&C) provides useful tools for turning these good intentions into action. On the broadest level, EE&C can help urban policy makers, planners,

managers, activists, and community members foster sustainable cities. On the practical level, EE&C approaches can contribute to the successful introduction of new services, the expansion or improved delivery of existing services, or the interpretation of policy into effective programs, regulations, and incentives.

Purpose of This Paper

This paper describes how EE&C tools can be used to—

- ▸ bring diverse stakeholders together to identify and prioritize urban environmental issues affecting them;

- ▸ define specific behaviors that target audiences should adopt to solve these priority issues;

- ▸ inform, educate, and motivate target audiences; and

- ▸ work with these audiences to implement workable, cost-effective programs.

Finally, the paper proposes indicators that may help identify how EE&C has succeeded in helping to meet urban environmental objectives.

These aspects of a program, these strategies and concepts, are important techniques in achieving the third element of sustainability--citizen support and participation.

EE&C in an Urban Setting

EE&C is often thought of as dealing primarily with school children and teachers around "green" topics such as wildlife conservation and forest management. EE&C does, of course,

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deal with these topics and with school-based audiences. However, EE&C strategies also focus on the urban issues of solid waste management, transportation, noise pollution, among other topics, and on audiences that include service providers, architects, and settlement dwellers.

Box 1
EE&C in the City

Because sustainable urbanization depends on creating practical policies and programs that are based on a sound understanding of human behavior, EE&C can be a pivotal tool. EE&C strategies help uncover the intrinsic logic of human behavior. This, in turn, reduces uncertainties in programs, anticipates problems and pitfalls, and weighs the costs and benefits of proposed alternatives.

Depending on target audience and objectives, EE&C takes place in a rich variety of formal, nonformal, and informal settings, including schools, work sites, neighborhood associations, NGOs, and the media. The opportunity to work in these various settings holds particular promise for sustainable urbanization. The behaviors practiced by urban officials, residents, commuters, business owners, and others all have an impact on the urban environment.

EE&C combines a variety of approaches drawn from education, anthropology, behavioral research, and communication theories to create tools such as social marketing, gender analysis, and participatory methodologies. These tools lead to a better understanding of what motivates people, what hinders them, and what systematic barriers they face in choosing whether or not to adopt environmentally positive behaviors.

Another misperception about education and communication interventions is that printing a brochure, launching an advertising campaign, or holding a community meeting will "solve" the problem. Such methods are certainly a *part* of the EE&C toolbox. However, to implement effective interventions, a systematic process should be used that selects the appropriate target audience, conducts research to determine the audience's current behaviors and perceptions, and develops messages, programs, and products accordingly. In addition, the emphasis of EE&C must be on the needs of the consumer or client, rather than on the producer or provider. All this may sound like a luxury to a municipality with a shrinking budget and growing needs. Yet, the time and financial investment in engaging in this process can pay off in such tangible and intangible ways as higher recycling rates, improved water quality, and greater public support.

The following sections of this paper will show how EE&C can help—

Box 2
Five Steps of an EE&C Program

1. Assessment and research of the existing situation in relation to priority environmental concerns.

2. Planning in a process involving all stakeholders.

3. Pretesting and revision of programs, products, and messages

4. Implementation with targeted audiences.

5. Monitoring and impact evaluation of effects on concerned stakeholders.

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- ▸ identify the issues that most concern different groups of stakeholders;

- ▸ select specific behaviors that address these issues and are feasible for the target audience to perform;

- ▸ design results-oriented awareness and education strategies; and

- ▸ implement cost-effective urban programs and services.

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Issues Identification:
Getting It Right from the Start

Urban environmental problems do not exist in a vacuum. Most typically, one problem relates to many other problems in a web of social, economic, political, and environmental dimensions. The lack of safe drinking water, for example, may be due to inadequate shelter, population growth, and poor urban infrastructure. It results in heightened health risks, and perhaps labor shortages or a decline in tourism revenues. Similarly, crumbling roads worsen traffic congestion and increase both air pollution and the stress of daily living.

"EE&C provides a 'road map' for the issues that people feel need to be addressed first."

Urban residents can feel at a loss about what to deal with first to make things better; urban planners are faced with difficult choices about where to allocate scarce resources. EE&C approaches can help identify and prioritize issues. Through participatory planning, visioning processes, and focused research on people's current needs and priorities, EE&C provides a "road map" for the issues that people feel need to be addressed first. Often these strategies uncover a myriad of reasonable solutions to local problems. Community leaders and residents can use this information to determine where to expend their limited money, time, and political capital.

Bringing Stakeholders Together

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EE&C strategies can create an atmosphere that enables groups to contribute to urban participatory planning.

The municipality of **Zougha**, **Morocco** had been plagued with problems in solid waste collection. Piles of garbage were becoming a health hazard, despite a presumably adequate collection plan. One solution, to bulldoze the piles annually, was clearly unsustainable and insufficient. In an experiment to engage the full community in solving a problem, USAID's GreenCOM Project and the Environmental Health Project designed an opportunity to bring all relevant stakeholders to the table to discuss, analyze, and solve the problem.

After an initial visit, GreenCOM staff and Moroccan counterparts identified the categories of stakeholders that should be represented in the workshop. Local organizers invited most of these groups to select a delegate. Thus, people from neighborhood associations, municipalities, elected offices, and federal agencies came to the table. One group, the women of the community whose job it is to put their garbage out for collection, were not invited, although garbage collectors and truck drivers were. The commitment of the policy-makers was assured when the Acting Mayor and National Parlimentarian attended the entire workshop.

"Exercises created an atmosphere of trust and respect..."

The workshop was organized into three days of identifying both the problem and gaps in the collective knowledge about the problem, four days for data collection to fill in those gaps, and three days of full-group discussions, data analysis, and planning. Exercises were used during the first three days to engage people in discussions, to establish an atmosphere of trust and

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respect, and to emphasize the power of working together. As the problem definition was narrowed, women were seen as a key to the solution; their absence was identified as a problem. After observing facilitator-led interviews and focus groups, the workshop participants conducted their own interviews to learn about pick-up schedules and transfer points, and mapped different collection "chains" to compare neighborhood coverage. This period was used to collect the voices and perspectives of women and others who were not represented at the table. A female social scientist was hired to conduct focus groups with women. When the group reconvened, a new interpretation of the reality of solid waste collection was revealed and alternate schemes for resolving the problem were generated.

Box 3

Three important aspects of the Morocco workshop:

1. Participants interviewed residents, collected data, and discovered information about the problem of solid waste collection. They were not told facts collected by other experts. They discovered this information.

2. Stakeholders who were not invited to the meeting were heard, in the end, because their opinions were invited. Their first-hand impressions provided valuable information.

3. The workshop itself created a synergy of working together that is not the norm for this community. This synergy has been supported and sustained by the concrete actions that have already occurred.

In the end, this 10-day exercise generated an action plan for improving solid waste collection that was conceived and approved

"Participation in the design of the program has contributed to a sense of ownership and responsibility for the program."

by all stakeholders. Over the next few months, the momentum from the workshop carried into several community meetings, hiring of several waste haulers, and two clean-up campaigns. A task force composed of community members, policy makers, and implementors began meeting regularly to discuss community issues and provide oversight. Participation in the design of the program has contributed to a sense of ownership and responsibility for the program. It may foster additional involvement and ultimately, a sustainable solution. Those involved in the process are hopeful that this successful experience will transfer to other issues where the community can become more active in working with the government to resolve issues.

A different process had similar results in ***Chattanooga, Tennessee***. This community has received widespread renown for its efforts toward sustainable urbanization, including recognition as a "Best Practices" initiative at HABITAT II. Yet only twenty-five years ago, Chattanooga had the worst air pollution in the United States. Factory closings, abandoned housing, and toxic waste sites added to the city's environmental and economic decay. Citizens were fed up, but many felt that only the elite made decisions about city priorities. Beginning in the early 1980s, local leaders channeled that frustration into creative cooperation. With the support of the city's traditional leadership, citizens created a nongovernmental organization called Chattanooga Venture. As one of its first tasks, Chattanooga Venture facilitated what became known as the Vision 2000 process. A private foundation funded the expenses involved in bringing Chattanoogans from all walks of life together to build a consensus about what their city could become by the turn of the century.

More than 1,700 people participated in a twenty-week series of "visioning" sessions. A consensus emerged for a cleaner, greener, safer city with rehabilitated housing and non-polluting jobs.

Thousands of ideas were boiled down into forty concrete goals. In all, 223 projects arose from the visioning exercise, including the construction of the Tennessee River park and the Tennessee Aquarium and a commitment to upgrade all substandard housing in the city. This exercise in participation also taught a lesson; residents realized that if they wanted a better urban environment, they would have to do the work themselves. Only a third of the $739 million investment was public funding; the rest came from the private sector.

A 1992 survey showed that 37 of the original 40 goals had been fully or partially completed. Problems remain for the city, such as dealing with the continued toxicity of Chattanooga Creek. In 1993, Chattanooga Venture facilitated a second community-wide visioning process. Two interesting trends emerged. First, residents looked to this participatory mechanism as the preferred way to identify and solve local problems. Second, in both visioning rounds, citizens recognized the key role that environmental quality played in helping solve health-related and economic concerns.

"Residents looked to this participatory mechanism as the preferred way to identify and solve local problems."

In other municipalities, leaders and community members have used the Local Agenda 21 (LA21) Initiative, which emerged from the United Nations Conference on Environment and Development, as a way to identify and prioritize issues. LA21 is designed to encourage municipalities to consult with their constituents to build a consensus on *local* ways to achieve sustainable development.

"Through this process, city leaders knew where the people wanted action directed."

In *Tanzania*, the Sustainable Dar es Salaam Project (SDP) was launched

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in 1992. In August of that year, a City Consultation was held in which municipal officials, NGOs, and other key stakeholders participated. The Consultation created a definition and rank order for nine of the city's most pressing environmental issues; the top two (improving solid waste management and upgrading unserviced settlements) were chosen for immediate attention. Through this process, city leaders knew where the people wanted action directed. Public/private working groups developed intervention strategies and funding proposals for the two priority issues. Solid waste service, while still nascent, has begun with the construction of a sanitary landfill and collection of about 10 to 15 percent of the waste generated daily (in 1992, virtually none was collected).

Listening to People

The municipality-wide participatory processes described above play an important role in identifying issues and setting broad priorities and goals. At other times, however, government and community leaders do not have the time, money, or need to engage in such processes. EE&C can provide smaller-scale and more focused methods to gauge people's priorities. Tools include household surveys, focus groups, and participatory appraisals.

> *"EE&C can provide smaller-scale and more focused methods to gauge people's priorities."*

An example from a village setting illustrates how this process can work. In **Egypt**, the Ministry of Public Works and Water Resources set up a new Communications Unit. The Minister requested that the Unit devise a pilot campaign to help clean up the country's network of irrigation canals, called *mesqa*s. It was assumed that the campaign would stress the benefit of clean mesqas. Members of the Communication Unit, with the assistance of an Egyptian research firm, visited several villages. They talked with men and women, young and old.

By listening to and heeding the responses, the Ministry learned that the community was already aware of the value of clean mesqas, but felt that the government was not doing its share in keeping them clean. As a result, the campaign had a new focus—how the Ministry and the community could work together in the future. In addition, the women pointed out that a lack of disposal facilities often resulted in people dumping trash into the mesqa for lack of an alternative. Although garbage disposal is not officially in the purview of the Water Ministry, Ministry staff recognized that issues such as this cross bureaucratic divisions,

and has begun making garbage disposal facilities available near mesqas.

In the ***Philippines***, policy efforts to promote community-based forestry included interviews with all Senators and members of Congress to determine their attitudes and possible votes for the policy reform effort. An expectation of negativity turned out to be false. Results showed that most policy makers were not hostile; rather, because they did not have the time to study the issue, most relied on a small group of legislators and voted accordingly. Based on these findings, the campaign then narrowed to explain the policy to these key individuals and encourage them to become advocates for their peers.

Getting the "Who" Question Right

Too often, engineers and planners use generic terms to discuss client populations. As stated earlier, focusing on "the community," "households," "customers," and other groups is important and necessary.

> *"Gender analysis serves to provide keener insights into household or community behavior."*

However, it is equally important to take this orientation another step, by disaggregating groups by gender and developing programs and strategies accordingly. Gender analysis serves to provide keener insights into household or community behavior. Research into recycling behaviors in ***Quito, Ecuador***, revealed that the men and women in target households had different perceptions of recycling and would respond to different messages.

Planners sometimes need to take into account an informal economy, primarily made up of women seeking income for their

families. In ***Kathmandu***, when the city planners wanted to initiate a waste collection system, they had to take into account an informal, existing system that provided much-needed income to women and children. This is not to say that the existence of informal services precludes the introduction of new technologies or services. Rather, urban planners should incorporate the needs of the people—men, women, and children—who make up the informal sector. In doing this on a proactive basis, they minimize problems from occurring in midstream.

Behavior Identification: Determining Realistic Target Behaviors

As municipalities focus on an issue, they begin to develop objectives—perhaps an increase in recycling rates, a decrease of discharges into the river, or the creation of new, non-polluting jobs. EE&C helps break down these broad objectives into the specific behaviors needed to accomplish them. It then identifies the constraints or benefits that affect whether or not individuals adopt the desired behaviors.

A process adapted by the U.S. Agency for International Development's Environmental Education and Communication (GreenCOM) Project from the health-behavior field can help in this regard.[1] The process consists of four main steps:

▸ **Identify the "ideal behaviors" needed to implement the practice.**

Officials in the city of ***Quito, Ecuador***, wanted to increase recycling rates. When this goal was analyzed, it turned out that it required families to undertake a series of specific behaviors: separating their waste into three categories (organic, recyclable, and unusable waste), storing the three types in separate containers, and setting each out for collection on a different day of the week, using certain receptacles, and a host of

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[1] This section is derived from the manual *Starting with Behavior: A Participatory Process of Selecting Target Behaviors in Environmental Programs*, by Elizabeth Mills Booth (see References).

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other actions. The most critical of these "other actions" was giving the recyclable products to a municipal waste collection system and thus foregoing a small amount of family income.

A multi-disciplinary team of individuals, all of whom contribute different expertise to the table, can bring a variety of perspectives to the analysis of ideal behaviors. From their different vantage points, they can break overall goals and practices into single, observable behaviors.

▸ **Conduct research with "do-ers" (men and women currently conducting the ideal behaviors) and "non-doers" (those who are not).**

This methodology grounds the set of ideal behaviors to reality. Interviews, focus group discussions, and field observation can reveal the factors that influence whether or not certain behaviors are or can be performed. These factors can be external. (In the recycling case, is the current service reliable? Are there fees involved for compliance or non-compliance?) Internal factors also influence behavior performance. (Do the non-doers know how to separate their trash? What or who motivates the do-ers to put their recyclables out on the street on the right day for pick-up?)

▸ **Select and negotiate target behaviors.**

Examining the original list of ideal behaviors against the findings gained from field research can help program planners develop a core set of target behaviors on which to build educational and promotional strategies. A behavior can be ideal from an environmental point of view, but attempts to encourage its adoption will fail if it cannot feasibly be performed on a sustainable basis. For example, if people do not have room in their homes to store waste until the collection day, they will not

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wait. If, on the other hand, an informal waste collection system exists, it may provide an attractive economic alternative to the potentially more efficient municipal collection system that does not purchase materials from households. Before behavior change strategies are designed, however, it is important to identify specific behaviors that are worth changing, from the perspective of all the stakeholders.

▸ **Develop strategies**

The research with do-ers and non-doers feeds into the design of education and communication strategies. Communication specialists look at whether the absence or incorrect application of a behavior is caused by a *skills* deficit or a *performance* deficit. In the case of a skills deficit, the target audience lacks the knowledge, information, or reminders to perform the behavior correctly. In the case of a performance deficit, the audience already has the skills to perform the target behavior, but does not act on this knowledge.

By setting behavior-based objectives that are grounded in reality, urban educators and communicators can develop the appropriate strategies to produce results.

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Awareness and Education: Getting the Right Information to the Right Audiences

Through the processes described in the previous sections, diverse groups can set overall urban environmental objectives and add specificity to the behaviors needed to achieve those objectives. Through public awareness and education programs, EE&C can provide target audiences with the attitudes, knowledge, and skills needed to help develop and then feel ownership of the proposed solutions. As noted in the first section of this paper, public awareness and education products developed in a vacuum will not do the job. Building these programs on a foundation of assessment and research increases their chance of success.

> *"Public awareness and education products developed in a vacuum will not do the job."*

Public Awareness for a Purpose

In *Cartagena, Colombia*, a coalition called Cartagena Convida launched a five-year campaign to clean up the highly polluted waters in the bay that surrounds the city. The campaign has a specific objective: to build enough public support to push the government to implement clean-up plans that have been prepared for several years. The project began in 1994 when Conservation International (CI), an international NGO, was asked to examine some of the environmental implications of the deteriorating Cartagena Bay, as well as the possible use of communications as a conservation tool.

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> *"The group organizers recognized that the information effort would have to be long term, with benchmarks along the way to mark progress."*

In early 1995, CI facilitated a workshop that involved representatives of many groups which held a stake in the bay. They included residents, scientists, street vendors, government officials, communication experts, and industry owners, among others. They also included citizens of poor neighborhoods built directly on sludge and sediment from the bay. The group organizers recognized that the information effort would have to be long term, with benchmarks along the way to mark progress. They formed an ongoing coalition and hired a small staff, who, over the next few months, met with dozens of individuals and groups to gather information, try out new ideas, and get feedback. The campaign, now in its final planning stages, will include a range of approaches to reach different audiences, including street theater, media outreach, sophisticated advertising campaigns, and advocacy training, as well as monitoring techniques built in throughout.

Banjul, The Gambia, like many African cities, has experienced huge, unplanned population growth over the past decade. Periurban sprawl has increased pollution levels, reduced forest and land cover, and eroded the coast. In 1994, the National Environment Agency (NEA) launched a national environmental awards scheme that moved both urban and rural environmental issues to the forefront of the public agenda. NEA brought together a broad range of government and non-governmental representatives to develop and implement the scheme. They designed award categories that encompassed environmental projects that neighborhoods, micro enterprises, schools, industry, and other groups could undertake.

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From the first announcement of the program to the final awarding of prizes, the public received a steady stream of information about the environment. Using the awards competition as a starting point, NEA was able to engage citizens in discussion about the country's environmental problems. An interactive radio program, group meetings, and interpersonal contacts provided ways for the people to communicate with members of the national and local steering committees and with other environmental leaders.

School-Community Linkages in Urban Areas

While this paper has made the point that EE&C extends well beyond the school, the fact remains that environmental education in formal, or school-based, settings plays an important role in improving the urban environment in several dimensions. Over the long term, well-designed EE&C programs for children can help instill knowledge

"In the short term, environmental education that deals with locally relevant topics can strengthen the link between the school and the community."

and attitudes that favor environmentally responsible action. In the short term, environmental education that deals with local, urban topics can strengthen the link between schools and their communities, help resolve environmental issues by allowing students to practice problem-solving skills while exploring reasonable solutions, and impart information to adults via their children.

Urban environmental education involves teaching urban residents, in urban areas, about urban systems and issues. Innovative urban environmental education programs may combine architecture and engineering with environmental studies to explore how buildings and bridges stay up or how water flows

in and out of apartment buildings. By helping students become more familiar with their urban home, educators are preparing citizens who will be more capable of making wise decisions about funding water systems or repairing infrastructure, for example.

Some urban education programs in *Canada* and *Great Britain* are based in *urban studies centers* where students collect and analyze data from the "field." They may map a neighborhood, observe feeding behavior of various color varieties in the local pigeon population, or measure the temperature gradient throughout a city.

In *Brooklyn, New York*, the Council on the Environment of New York City sponsors successful urban education programs at the secondary level. In one of their recent projects, staff worked with several schools in the Greenpoint-Williamsburg neighborhood where Latino, Polish, and Hasidic communities bear a disproportionately larger share of New York City's waste than other communities. The program is designed to equip young people with skills they need to make positive contributions to their communities and initiate projects that improve the environment.

In this project, staff worked in two to three classes in each of seven schools for an entire semester, leading a dynamic educational process. First students discussed and selected local environmental issues. As they learned about the

> *"Students learn about this issues, then develop improvement projects and action strategies."*

issues, they developed improvement projects and action strategies. In the United Talmudical Academy, 11- and 12-year old students completed home surveys of household toxics and wrote a Yiddish language brochure about the most harmful household chemicals and their alternatives. Public high school

students in an Environmental Humanities course produced a humorous video on household toxics and their alternatives. They went on to plant numerous trees and shrubs in their community and improve a rooftop inner courtyard with paint and plantings.

In a Catholic middle school, students explored lead sources, health effects, and prevention strategies. They wrote letters and articles to three local newspapers in Polish and English, gave presentations to other classes, and testified at a local hearing on the issue of lowering the amount of lead in paint that defines it as "lead paint." Each of these activities is an excellent example of environmental education that improves the sustainability of the urban environment by enhancing the ability of people to create and manage their community. These students and teachers experienced environmental action and political efficacy in ways that increase the likelihood that they will continue to be active, contributing members of their community.

Volunteers assist urban youth in exploring nature in the city through the VINE Project (Volunteer-led Investigations of Neighborhood Ecology), sponsored by the North American Association for Environmental Education. In fifteen cities in the *United States*, parents, community members, and secondary students are trained to lead interactive, hands-on science activities with small groups of young people, from schools or youth clubs. By studying the plants and animals at playgrounds and local parks, young people become more interested in science and more attuned to their environment.

In *El Salvador*, surveys conducted in 1994 showed that people considered solid waste one of their country's two most pressing environmental problems (deforestation was the other). Tapping into this concern, a local NGO, ENLACE, and the USAID-funded PROMESA project worked with 1,200 fifth- and sixth-

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graders in a periurban area near San Salvador in an activity entitled, "Detectivas de la Basura" (Garbage Detectives). The students conducted surveys of their families' garbage disposal practices, an educational activity with many benefits. The involvement of the students as researchers made the students more aware of the type of waste generated in their own household; the data they generated will help inform future educational activities.

A 12-page, illustrated survey booklet produced by ENLACE was fun to use and generated meaningful information about waste issues in this neighborhood. ENLACE pretested the questions to ensure students understood the vocabulary and concepts, and trained teachers in the subject matter and basic research techniques. "Detectivas" and a companion survey on fuelwood use were launched during a special "environment week" in 1994. Students collected data about the volume of garbage their family generated, and about where, when and how they disposed of it. Students recorded this information in the booklets, which included pages for them to express their own opinions about the severity of the solid waste disposal problem and ways the system could be improved.

Implementing Programs: Going from Awareness to Behavior Change

Awareness and education programs built upon behavioral data can assist in the implementation of new or expanded urban services or of local governance concerns. For example, EE&C strategies can—

▸ **Empower people to take action:** Once people have become more aware and knowledgeable, they may be ready for action, but they need and want to know what they can *do* that will make a difference. During focus groups conducted in *El Salvador*, participants said that they were already concerned about environmental degradation, but they did not know what they could do to solve it. In response, communicators designing a national environmental campaign changed their strategy from an awareness campaign to a campaign promoting specific behaviors that urban and rural people could adopt to protect and conserve natural resources. In other situations, people may lack specific procedural knowledge that prevents them from conducting certain environmental behaviors and they may not be aware of exactly what they do not know.

▸ **Build upon what people are already doing correctly:** The social science methods used in EE&C identify what people are already doing that is similar to the target behaviors. Successful education and communication activities can build on what people are already doing correctly, rewarding and shaping their behavior toward

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the next step. This also ensures that urban environmental policies are more compatible with local cultural and social norms.

▸ **Develop practical methods to measure behavior change:** Measuring behavior change can strengthen and evaluate the impact of particular policies and programs. Such methods provide cost-effective, practical ways of monitoring progress and fine-tuning as necessary.

Introducing a New Water System in Haiti

Cité Soleil, outside of *Port-au-Prince, Haiti,* is an impoverished settlement scheduled to receive a potable water system, funded by the United Nations Development Programme. The system consists of a large water tank at the entrance to the settlement connected to a network of public fountains. It will be managed by the non-governmental Water Management and Sanitation Authority (WMSA). The U.S. Agency for International Development, through the Sustainable Cities Program, is assisting in the implementation of the system. WMSA faces many challenges, including how to motivate people to pay for the water, how to maintain the purity of the water until it is consumed, and how to motivate community members to participate in the management of the water district.

"WMSA faces many challenges, including how to motivate people to pay for the water, how to maintain the purity of the water until it is consumed, and how to motivate community members to participate in the management of the water district."

USAID requested that GreenCOM work with the Centers de Développement pour le Santé (CDS), a local NGO, to conduct formative research with Cité residents and to use the results to

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develop communication and social mobilization strategies. CDS conducted fifteen focus groups. All but one were organized as male-only or female-only sessions. They found that most residents were dissatisfied with their current service. Currently, some buy water from trucks, others retrieve it from reservoirs or other places. Most are aware of the health risks in drinking impure water and are willing to get involved in the new system.

This input fed into a Strategy Development Workshop, attended by thirty community leaders. The group's recommendations included establishing local committees around each fountain, hiring one person at each fountain responsible for maintenance and order, and setting up a ticket-based, rather than cash, system of payment. These recommendations alone will not guarantee the successful introduction and maintenance of the new service. However, they are useful pointers for how to involve the women and men of Cité Soleil in gaining and maintaining access to safe drinking water.

Expanding Recycling Services in Ecuador

In *Quito, Ecuador,* city officials instituted a pilot recycling program in a low-income area that had several features of direct benefit to the community. The program created jobs for neighborhood residents who were hired to collect and sell recyclables. Moreover, proceeds from the sale of the recyclables were returned to neighborhood committees, which used the money to finance local development projects of their choosing.

Despite these seeming benefits, participation in the program declined over time. The municipality wanted to know why. In 1995, Corporación OIKOS, an Ecuadoran NGO, and GreenCOM conducted a study to examine why only an estimated one-third of eligible residents participated in the program. Qualitative (focus groups and interviews) and quantitative (surveys) research revealed that waste separation could be predicted by four principal factors:

"Corporación OIKOS, an Ecuadoran NGO, and GreenCOM conducted a study to examine why only an estimated one-third of eligible residents participated in the program."

1. Knowledge of the pilot program guidelines and the kinds of waste products residents should be recycling;

2. Satisfaction with the waste collection service, particularly its reliability;

3. Attitudes about giving waste with commercial value to collectors; and

4. Normative beliefs about separating waste: that is, how a person perceives his or her family, neighbors, or others feel about recycling efforts.

Many did not know, or were skeptical about, the fact that recycling profits were channeled back to their neighborhood. The study recommended that this aspect was key to the success of the city's recycling program. However, the study also revealed a much more active informal waste economy than the city had known about. As in other cities, many families, including so-called "non-recyclers," practiced de facto recycling by selling their waste to scavengers and middlemen. The study

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recommended that the municipality decide whether its primary concern is a reduced amount of waste going to the landfill—in which case the informal economy could be tolerated or even encouraged—or whether it wants to increase development funds for neighborhoods.

Conserving Water in Jordan

In *Jordan*, water shortages are part of life. At times, the government rations water, and most citizens comply when required. Yet, according to focus groups held by the Royal Society for the Conservation of Nature (RSCN), many Jordanians feel that the country's water problems are caused by political problems with neighboring countries and that they, as private citizens, have no personal control over the country's water supply.

> *"RSCN wanted to find a way to introduce water-conservation behaviors into urban and rural homes."*

RSCN wanted to find a way to introduce water-conservation behaviors into urban and rural homes. Although not very active, the organization already sponsored eco-clubs in many secondary schools and decided this would be a cost-effective place to start. RSCN developed a water conservation curriculum that featured hands-on activities for students to undertake at school and at home. For the first time, RSCN involved teachers in curriculum development. For some of the teachers, this was their first exposure to interactive teaching methodologies. The curriculum was pretested in six urban and rural schools in late 1994, revised, and then launched with a teacher training workshop in early 1995. At the end of the school semester, evaluations took place with teachers and students. The evaluation of the teachers looked mostly at how they implemented the curriculum. For the students,

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however, the focus of the evaluation was on their knowledge, attitudes, and behaviors concerning water conservation. The most significant finding was that students who participated in the eco-club curriculum were more likely to advocate water-conserving behaviors at home than students who were not exposed to the curriculum.

Implementing Policy Reform in Asia

Sometimes the objective is not as tangible as the recycling of waste or the reducing of water use. How can EE&C help in the more amorphous area of policy change? By focusing on interventions that relate to weak or nonexisting policy or to lack of coordination among agencies and organizations, the Metropolitan Environmental Improvement Program (MEIP) has worked to improve environmental quality in six Asian cities. MEIP's approach to environmental improvement through policy change includes consensus building, information exchange within each city and between cities, capacity building, and the development of pilot programs.

MEIP is funded by The World Bank, UNDP, and a number of other donors and is working in ***Beijing, Bombay, Colombo, Jakarta, Kathmandu, and Manila***. MEIP facilitated the draft of environmental management strategies in Colombo, Manila, Bombay, and Jakarta. These strategies can serve to make policy, legal measures, and investments in the public and private sector consistent.

Indicators:
How Can Urban EE&C Be Measured?

Many proclamations and statements urge governments to develop and maintain urban-related indicators to measure the extent of poverty, economic growth, adequate housing, and other elements. If used in some of the ways described in this paper, EE&C can contribute to indicators which, in turn, result in improvement in the lives of urban populations and their environment.

Another way to determine whether EE&C strategies have helped to meet urban objectives is to develop a set of indicators related to the EE&C intervention itself. For example--

Issue identification

▸ How was the problem defined?

▸ What is the history of this problem? Who has worked on this issue previously? How do other communities solve this problem?

Audience identification

▸ How many men and how many women were involved in the process? How many members of disadvantaged groups?

▸   What was the extent of their involvement? What issues emerged, and, more importantly, what did the government do with the recommendations and priorities?

▸   How has capacity increased, especially among groups that traditionally had no part in public processes, to articulate views and ensure they are heard?

Behavior identification

▸   Who formed the multi-disciplinary team that defined and selected the ideal and target behaviors?

▸   How were the target behaviors proposed and finalized? Did it remain a participatory process from start to finish?

Awareness and education

▸   How many schools, community groups, service provider organizations, businesses, and others have programs that focus on local environmental topics?

▸   What is the percentage of the target audience that has been exposed through the media and other means to messages about a specific behavior?

▸   What is the percentage of the target audience who have knowledge of the benefits of the behavior and have acquired the skills and self-competence to perform it through educational programs?

▸   How many local groups advocate for environmentally sustainable measures? What is the response on the part of the government?

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Program implementation

- ▸ What percentage of the target audience agrees with the potential benefits of the behavior?

- ▸ What percentage of the target audience states they plan to practice the behavior?

- ▸ What percentage of the target audience has tried the behavior at least once?

- ▸ What percentage of the target audience has adopted the behavior on a regular basis?

- ▸ What percentage of the target audience promotes the behavior to others, such as to family members, others in the community, or officials?

Environmental education and communication is still only a part of the total equation to achieve sustainable urbanization. However, it should receive the same scrutiny as other elements of urban programs to determine if it is fulfilling its objectives or if adjustment is necessary.

Toward a People-Driven Urban Environmental Agenda

A s is clear in most of the current writings on urbanization, people must come together to find workable, cost-effective solutions. This paper has tried to present environmental education and communication as a tool to turn this objective into reality:

- ▸ EE&C strategies can help build community acceptance for new projects, but more importantly, can help add perspectives from relevant stakeholders to improve the projects, thus contributing to their sustainability.

- ▸ EE&C programs and products that rest on needs assessment and formative research can ensure that time, money, and political capital are being expended more effectively.

- ▸ EE&C can help urban planners consider the gender implications in proposed programs and services, thereby identifying potentially harmful implications so they can be prevented.

- ▸ EE&C can provide policy makers and planners with the tools for community-wide participatory visioning sessions.

- ▸ A behavior identification process can provide a way to identify target behaviors that would have a positive effect on the urban environment and are feasible for the target audience to perform on a sustainable basis.

▸ The knowledge gained from participatory and behavior-identification processes strengthen awareness and education programs. The programs can then be tied to achieving broader urban objectives, rather than just "raising awareness" for its own sake.

▸ Implementation can be enhanced through a systematic process that introduces the new behaviors needed to make the program work.

As urban areas grow, solutions must and can be found to provide housing, services, and opportunities to people while ensuring the health of the environment for future generations. By continuing to seek appropriate technology, an enabling policy framework, and the participation and support of the people, the fostering of sustainable cities can be achieved.

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